

### **ABSTRACT OF THE INVENTION**

Composite coating compositions, composite metallic coatings derived from these compositions, and methods of forming the composite coating compositions and composite metallic coatings, wherein the compositions and coatings comprise particles of at least one quasicrystalline metal alloy and at least one elemental metal. The methods include electrocodepositing suspended quasicrystalline metal alloy particles and dissolved metal ions onto a substrate. Preferably, the substrate is disposed in an aqueous bath containing at least one dissolved metal ion species and at least one suspended quasicrystalline metal alloy powder species. The compositions and coatings enhance the wear, friction, hardness, corrosion, and non-stick characteristics of the substrate.